

BROADUS RANDALL RANCH

POWDER RIVER COUNTY

The Randall Ranch air monitoring site was established by the Montana Air Quality Bureau to measure background levels of particulates in southeastern Montana. The site was located at 45 24 27 N and 105 27 50 W (Site No. 102 on Map II-1), approximately 5 miles south of Broadus on a bluff overlooking the Powder River. Elevation at the site was 3,120 feet.

Wind data were gathered at this site from March 6, 1976, to August 27, 1978. The data set contains hourly averages of wind speed and wind direction manually reduced from stripchart records. The wind recorder, a Meteorology Research, Inc., mechanical recording anemometer and wind vane, was located 4 meters above ground level.

Winds were monitored long enough to adequately represent the wind resource at this location. The site also is representative of a large portion of southeastern Montana. Data recovery, which for the entire period was 60.3 percent, ranged from 38.4 percent in December to 97.3 percent in May.

Average monthly wind speeds varied from 8.2 miles per hour in September to 12.5 miles per hour in December. Average annual wind speed was 10.1 miles per hour. December through May were the windiest months. The lowest wind speeds occurred from July through September.

Average annual wind power was 118.9 watts/m². Average monthly wind power values ranged from 67.6 watts/m² in September to 167.7 watts/m² in December.

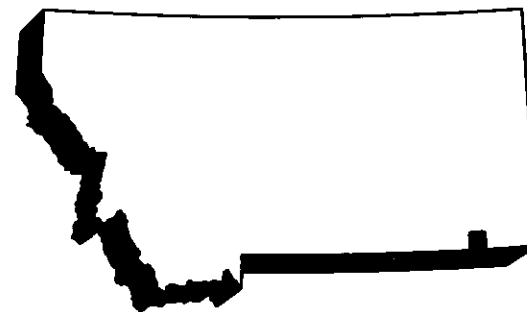


Table IV - 139

Monthly Wind Speed Distribution

POWDER RIVER COUNTY - BROADUS RANDALL RANCH

03/06/76 - 08/27/78

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR		
	CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	CALM	
	0.1-1.0	0.1	0.0	0.0	0.1	0.0	0.3	0.3	0.7	0.2	0.0	0.0	0.0	0.2	0.1- 0.4	
	1.1-2.0	2.7	0.7	1.0	1.1	1.3	2.6	2.1	3.0	2.6	2.8	2.0	0.3	1.8	0.5- 0.9	
S	2.1-3.0	8.5	1.6	2.8	4.3	4.0	4.9	5.0	5.4	6.9	5.4	5.0	0.9	4.6	1.0- 1.3	S
P	3.1-4.0	9.6	4.2	6.6	4.7	6.0	8.0	6.1	6.9	8.1	6.4	7.7	1.4	6.3	1.4- 1.8	P
E	4.1-5.0	4.7	4.2	8.3	6.3	7.2	7.0	8.6	7.8	10.4	8.7	7.5	3.3	7.2	1.9- 2.2	E
E	5.1-6.0	7.0	6.1	7.8	6.2	6.2	8.1	8.3	9.6	10.1	6.4	5.9	2.8	7.2	2.3- 2.7	E
D	6.1-7.0	5.8	4.2	6.1	6.7	7.4	9.0	10.8	8.7	10.5	8.7	6.4	6.6	7.7	2.8- 3.1	D
	7.1-8.0	5.3	5.7	4.8	6.5	6.5	8.3	8.9	8.3	7.2	9.4	7.0	6.3	7.1	3.2- 3.6	M
M	8.1-9.0	5.1	5.7	6.8	6.0	6.1	6.9	10.2	10.0	7.4	9.9	6.0	6.5	7.2	3.7- 4.0	M
I	9.1-10.0	6.5	5.7	6.2	5.7	6.0	6.9	6.9	7.6	5.2	7.2	5.5	6.6	6.3	4.1- 4.5	I
L	10.1-11.0	3.8	6.0	6.5	5.4	5.2	5.7	6.3	7.0	5.0	5.7	6.2	5.4	5.7	4.6- 4.9	L
E	11.1-12.0	4.6	7.3	6.3	5.0	5.5	5.8	4.4	3.8	4.8	4.7	6.9	8.6	5.4	5.0- 5.4	E
S	12.1-13.0	2.6	7.3	3.9	3.9	5.3	4.4	5.2	3.7	3.9	3.9	5.4	7.3	4.6	5.5- 5.8	S
/	13.1-14.0	4.2	4.8	3.4	4.4	5.0	4.0	3.4	3.1	2.9	3.1	5.5	5.2	4.1	5.9- 6.3	/
H	14.1-15.0	4.9	6.1	3.4	5.3	4.2	3.8	3.2	2.5	2.5	3.3	2.8	7.3	4.1	6.4- 6.7	H
O	15.1-16.0	4.1	5.8	3.7	4.3	3.8	2.4	2.0	2.7	2.7	3.7	4.4	3.5	3.5	6.8- 7.2	O
U	16.1-17.0	3.7	4.6	3.6	3.8	3.3	2.4	2.2	1.6	1.8	2.2	2.5	5.2	3.0	7.3- 7.6	U
R	17.1-18.0	3.4	4.8	2.6	3.5	2.4	2.1	1.6	2.2	2.2	1.1	1.7	3.5	2.6	7.7- 8.0	R
	18.1-19.0	3.0	3.3	2.4	2.4	2.3	2.0	1.5	1.0	1.1	2.4	3.5	4.0	2.3	8.1- 8.5	
	19.1-20.0	2.0	2.7	1.9	1.9	2.2	1.2	0.7	1.0	0.6	0.3	2.8	3.3	1.7	8.6- 8.9	
	20.1-25.0	6.0	8.2	7.7	8.7	6.8	3.4	1.5	2.0	3.2	3.1	3.7	10.0	5.5	9.0-11.2	
	25.1-30.0	1.6	1.2	3.4	3.4	2.1	0.9	0.3	0.9	0.4	1.2	1.3	1.7	1.7	11.3-13.4	
	30.1-35.0	0.5	0.1	0.7	0.5	0.9	0.0	0.2	0.2	0.2	0.4	0.2	0.0	0.4	13.5-15.6	
	35.1-40.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	15.7-17.9	
	>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	>17.9	
	AVERAGE															
	SPEED (MPH)	10.1	11.9	11.0	11.4	10.8	9.0	8.5	8.5	8.2	9.0	9.9	12.5	10.1		
	AVERAGE															
	SPEED (M/SEC)	4.5	5.3	4.9	5.1	4.8	4.0	3.8	3.8	3.7	4.0	4.4	5.6	4.5		
	AVERAGE															
	WIND POWER															
	(WATTS/M**2)	136.7	153.6	163.6	163.4	144.0	80.8	75.0	70.3	67.6	85.8	107.6	167.7	118.9		
	PERCENT DATA															
	RECOVERY	49.6	50.0	42.6	93.9	97.3	66.7	52.1	55.2	62.3	49.5	41.5	38.4	60.3		

ANEMOMETER HEIGHT = 4 METERS = 13 FEET

NUMBER OF OBSERVATIONS = 13092

PERCENTAGE DATA RECOVERY = 60.3

SOURCE: GEORESEARCH, INC.